A/N: 09/379,753

IN THE CLAIMS:

Please cancel claims 15-22 and 52-56 as drawn to a non-elected invention, without prejudice or disclaimer.

Please substitute the following amended claims for each of the corresponding original claims. A copy of the marked-up claims is attached.

1.   (thrice amended)   A substrate etching apparatus comprising:

(a)   a chamber comprising a substrate support to support a substrate, a gas distributor to introduce an etchant gas into the chamber, a gas energizer to energize the etchant gas, a gas exhaust to exhaust gas from the chamber, and a radiation source;

(b)   one or more detectors to (i) detect an intensity of a first radiation originating from the radiation source and reflected from the substrate or a chamber wall and generate a sample signal, and (ii) detect an intensity of a second radiation emitted from the radiation source and generate a reference signal; and

(c)   a signal analyzer adapted to normalize the sample signal relative to the reference signal by mathematically operating on the sample signal with the reference signal to generate a normalized signal and determine a thickness of a layer being etched on the substrate or chamber wall from the normalized signal.

A/N: 09/379,753

23. (twice amended) A substrate etching apparatus comprising:

(a) a chamber capable of etching a substrate, the chamber comprising a substrate support to support the substrate, a gas distributor to introduce an etchant gas into the chamber, a gas energizer to energize the etchant gas, a gas exhaust to exhaust gas from the chamber, and a radiation source;

(b) a detector to detect a reflected radiation from the substrate or a chamber wall and generate a sample signal; and

(c) a signal analyzer adapted to receive the sample signal and determine a corrected sample signal, X_{nt}, using the expression $X_{nt} = X_t / \{Y_0 + C(Y_t - Y_0)\}$,

where C is a correction factor, Y_0 is a reference signal at time 0, X_t is the sample signal at time t, and Y_t is the reference signal at time t.

A/N: 09/379,753

30. (twice amended) A substrate etching apparatus comprising:

(a) a chamber capable of etching a substrate, the chamber comprising a substrate support to support the substrate, a gas distributor to introduce an etchant gas into the chamber, a gas energizer to energize the etchant gas, a gas exhaust to exhaust gas from the chamber, and a radiation source;

(b) a sample detector to detect a reflected radiation from the substrate or a chamber wall and generate a sample signal;

(c) a reference detector to detect a reference radiation from the radiation source and generate a reference signal;

(d) one or more first fibers to transmit the reference radiation from the radiation source to the reference detector and one or more second fibers to transmit the reflected radiation from the radiation source to the chamber, the first and second fibers arranged to receive radiation from one or more areas of the radiation source that have about the same size; and

(e) a signal analyzer adapted to normalize the sample signal relative to the reference signal by mathematically operating on the sample signal with the reference signal to generate a normalized signal, and determine a thickness of a layer being etched on the substrate or chamber wall from the normalized signal.

34. (twice amended) An apparatus according to claim 30 wherein the first and second fibers are arranged to have substantially overlapping fields of view.

37. (twice amended) An apparatus according to claim 30 further comprising a signal analyzer to receive the reference and sample signals and normalize the sample signal relative to the reference signal to generate a normalized signal by mathematically operating on the sample signal with the reference signal, and determine a thickness of a layer being etched on the substrate or chamber wall from the normalized signal.

38.   (twice amended)   A substrate etching apparatus comprising:

(a)   a chamber capable of etching a substrate, the chamber comprising a substrate support to support the substrate, a gas distributor to introduce an etchant gas into the chamber, a gas energizer to energize the etchant gas, a gas exhaust to exhaust gas from the chamber, and a radiation source that includes a plasma;

(b)   a sample detector to detect a reflected radiation from the substrate or a chamber wall and generate a sample signal;

(c)   a reference detector to detect a reference radiation from the plasma and generate a reference signal;

(d)   one or more fibers to transmit the reference radiation to the reference detector, the fibers arranged to receive reference radiation which is not reflected from the substrate; and

(e)   a signal analyzer adapted to normalize the sample signal relative to the reference signal by mathematically operating on the sample signal with the reference signal to generate a normalized signal, and determine a thickness of a layer being etched on the substrate or chamber wall from the normalized signal.

A/N: 09/379,753

40.   (thrice amended)   A substrate etching apparatus comprising:

(a)   a chamber comprising a substrate support to support a substrate, a gas distributor to introduce an etchant gas into the chamber, a gas energizer to energize the etchant gas, a gas exhaust to exhaust gas from the chamber, and a radiation source other than a plasma in a process zone in the chamber;

(b)   one or more detectors to detect an intensity of a first radiation reflected from the substrate or a chamber wall to determine a thickness of a layer on the substrate or chamber wall, and detect an intensity of a second radiation from the radiation source; and

(c)   a feedback controller adapted to regulate a power level of the radiation source in relation to the detected intensity of the second radiation.

44.   (thrice amended)   A substrate etching apparatus comprising:

(a)   a chamber comprising a substrate support to support a substrate, a gas distributor to introduce an etchant gas into the chamber, a gas energizer to energize the etchant gas, a gas exhaust to exhaust gas from the chamber, and :

(b)   a radiation source capable of generating a radiation;

(c)   a first detector to detect a property of the radiation from the radiation source and generate a reference signal in relation to the property;

(d)   a radiation modulator in a path of a radiation being transmitted from the radiation source to the chamber, the radiation modulator being adapted to receive the reference signal and control a property of the radiation in relation to the reference signal; and

(e)   a second detector in a path of the radiation, the second detector capable of detecting an intensity of the radiation reflected from the substrate or a chamber wall to determine a thickness of a layer being etched on the substrate or chamber wall.

A/N: 09/379,753

57.   (twice amended) A substrate etching apparatus comprising:

a chamber comprising a substrate support to support a substrate, a gas distributor to introduce an etchant gas into the chamber, a gas energizer to energize the etchant gas, a gas exhaust to exhaust gas from the chamber, and a radiation source;

one or more detectors to detect an intensity of a radiation reflected from the substrate or a chamber wall to generate a sample signal that may be used to determine a thickness of a layer being etched on the substrate or chamber wall, and to detect a property of a radiation from the radiation source and generate a reference signal in relation to the property; and

a feedback controller adapted to regulate a power level of the radiation source in relation to the reference signal.

Please add the following claim:

60.   (new) An apparatus according to claim 40 wherein the one or more detectors generate a sample signal from the detected intensity of the first radiation and generate a reference signal from the detected intensity of the second radiation, and wherein the apparatus comprises a signal analyzer adapted to normalize the sample signal relative to the reference signal to generate a normalized signal by mathematically operating on the sample signal with the reference signal, and determine a thickness of a layer on the substrate or chamber wall from the normalized signal.